



# Submaximal Exercise Capacity Between Beet Juice and Caffeine

Author: Andrew Ballard, KINE 4400

Cardiovascular Research Laboratory, The University of Texas at Arlington,  
Arlington, TX

Faculty Sponsor: J.R. Wilson, Ph.D.



## Introduction

Both caffeine and beet juice have been used by athletes and trainers around the world in order to help boost their energy levels and perform longer. Beet juice is used because it contains healthy and natural substances that are essential for the body. However, the main one that athletes are looking for in beet juice is nitrate, because it causes vasodilation in the blood vessels. Caffeine, on the other hand, is the most common substance used by athletes. It is used by athletes because it is an ergogenic aid, which is through to give athletes enhanced energy levels for improved performance.

## Purpose

The purpose of this study was to evaluate the submaximal exercise effects of caffeine and beet juice to determine any differences.

## Methods

One woman (W; age 23 yrs) and four men (M; age  $29.5 \pm 8.9$  yrs) of the UTA Kinesiology department, volunteered to participate in this study. 20 minutes before the study subjects were asked to drink 12 oz of beet juice or coffee

## Methods (cont'd)

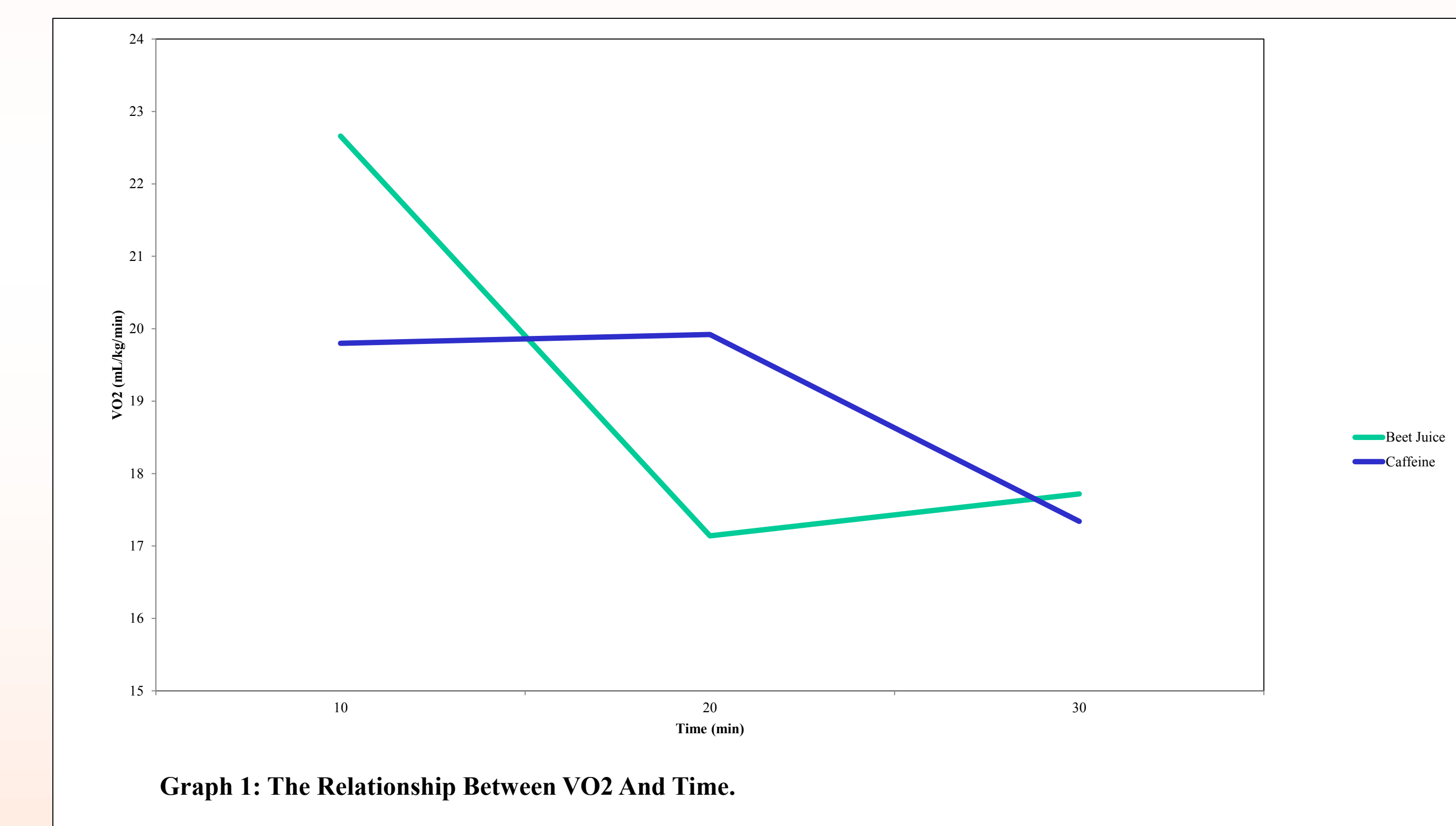
While the subjects waited, they were asked age, height, weight and a heart rate monitor was attached to their chest to allow measurement of heart rate. This signal was sent to a watch and the heart rate was read from there. Then they sat on the exercise bike while the headgear was fitted to their head in order to hold the mouthpiece in place. A mouthpiece, similar to that used for snorkeling, was used along with a nose clip to ensure that exhaled air can be collected in the metabolic cart during the exercise. This allows the calculation of oxygen consumption, a measure of aerobic fitness. Blood pressure was taken every 10 minutes along with a rate of perceived exertion score (RPE) with ratings from 6 (rest) to 20 (maximal exercise). The bike was adjusted to 70% of their age predicted max heart rate. They rode the cycle ergometer at 50 rpm for 30 minutes.

## Results

The average  $VO_2$  intake for the beet juice (BJ) group was  $19.17 \pm 6.08$  mL/kg/min and  $19.02 \pm 1.46$  mL/kg/min in the caffeine group (C). This was not a significant difference ( $p = 0.93$ ). The average systolic blood pressure in the BJ group was  $156.26 \pm 3.47$  mmHg and  $159.3 \pm 5.66$  mmHg in the C group. This was also not significantly different ( $p = 0.61$ ).

## Results (cont'd)

The average diastolic blood pressure was  $77.3 \pm 1.01$  mmHg in the BJ group and  $73.33 \pm 1.01$  mmHg in the C group. This data did not approach a significant difference ( $p = 0.17$ ). Finally, the BJ group average RPE was recorded as  $11.53 \pm 1.17$  while the C group had an average of  $11.86 \pm 1.4$ . This was not a significant finding ( $p=0.29$ ).



## Conclusions

The results of this study do not support previous findings that beet juice has an effect on submaximal exercise performance..